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| EXAMINER | |
|---|---|
| JANCA, ANDREW JOSEPH | |
| ART UNIT | PAPER NUMBER |
| 1797 | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/563,191 | SCHANZ ET AL. | |
| | Examiner | Art Unit | |
| | Andrew Janca | 1797 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *20-49* is/are pending in the application.

4a) Of the above claim(s) *32-48* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-31 and 49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Terminal Disclaimer*

1. The terminal disclaimers filed on 6/22/09 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Numbers 10/563,354 and 10/563,348 have been reviewed and is accepted. The terminal disclaimer has been recorded.

### *Response to Arguments*

2. Applicants' arguments filed 6/22/09 have been fully considered but they are not persuasive.

3. Regarding the first page of Applicants' Remarks (p 12 paras 2-3), Applicants are directed to paragraph 6 of the prior action, repeated in the rejections below, for reference to the microstructure units recited in the claims. Regarding the last paragraph of p 12, Applicants' disclosure does not supply an explicit definition of "microstructure unit", but rather a description of desirable properties a "microstructure part" might have. Where the specification does explicitly discuss the term "microstructure unit", it is to note that "The microstructure units, however, can also be linear, unbent or have any other geometric shape" (Specification 7/24/06 p 8, lines 2-3). The raised structure separating the part channels 32 of Ehrfeld (figure 3a) is a physical structure, the outer walls of which define the inner walls of part channels 32. Since it is part of a disk taught for use in a micromixer (Ehrfeld: title, claims 1-22), it may be reasonably be called a

"microstructure unit", and so unquestionably is included in the scope of Applicants' claims.

4. Regarding page 13 of the Remarks, channel 31 and each leg of channels 32 may reasonably be considered a channel which may be identified as different from each other, despite the absence of valves or physical dividers between them. The Bristol Channel, St George's Channel, and the Irish Channel (Straits of Moyle) circling around the western coast of Great Britain have no barrier preventing their fluid communication: they flow one into the other sequentially, but are given separate names because they can be separately identified upon a map. The Arkansas River and White River bifurcating off the Mississippi River in the state of Arkansas were considered separate channels for the centuries after they first received those names, long before the introduction of locks and barriers which partly separated them in modern times.

5. In response to Applicants' request (p 13 para 4), figure 3a (with identification by part numbers or description relative to part numbers) of Ehrfeld was the provided citation from the prior art in the previous action. Annotated versions of this figure are presented in the rejections below for convenience.

### *Claim Rejections - 35 USC § 103*

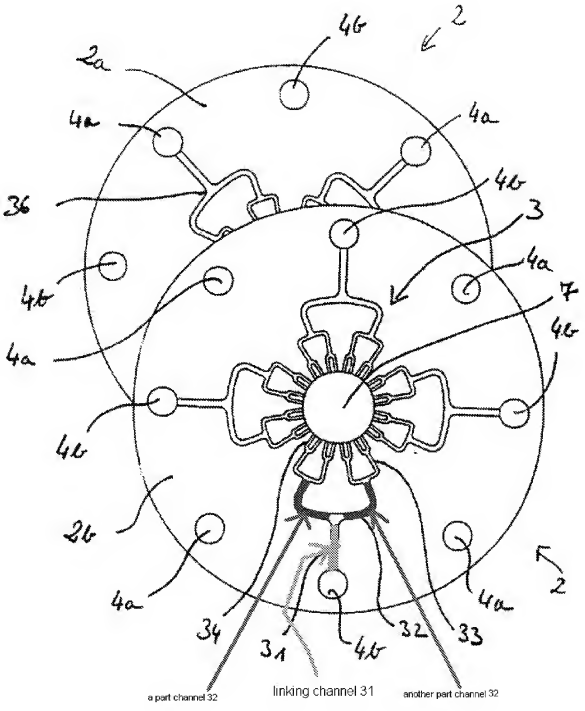
6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

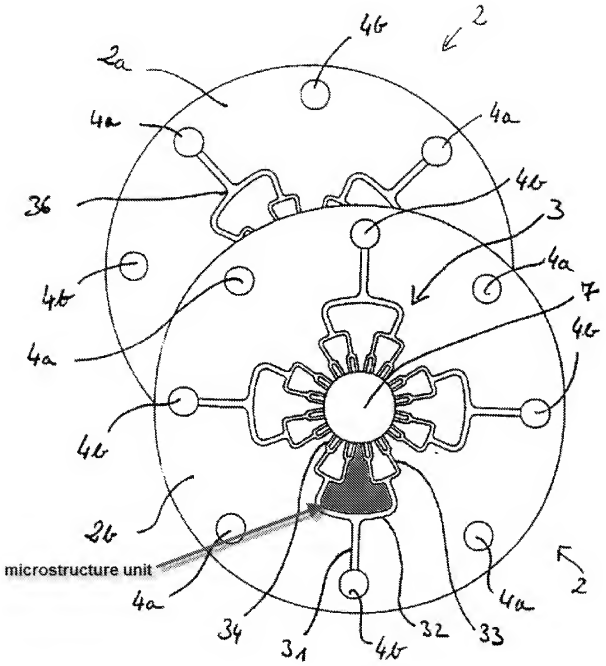
7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 20-30 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0039169 A1 to Ehrfeld et al.

9. **Channels:**




10. **A microstructure unit:**




11. With regard to claim 20, Ehrfeld et al teach a packaging system for in-situ preparation of a formulation from at least two constituents, in which said at least two

constituents are separately stored until said formulation is prepared (para 15), wherein said packaging system comprises at least two separate storage chambers for storing said at least two constituents separately (para 15) and at least one static micromixer (Ehrfeld et al claim 15) for mixing said at least two constituents to prepare the formulation; wherein said at least one static micromixer comprises at least one component in the form of a disk (2a, 2b) (figure 3a, para 51); wherein said disk (2a, 2b) is provided with at least one inlet opening (4b) disposed in a plane of said disk for introduction of at least one feed stream into a linking channel (31) and with at least one outlet opening (34) disposed in the plane of said disk for outflow of the feed stream into a mixing zone (7), said at least one inlet opening (4b) being connected with said at least one outlet opening (34) in a communicating manner via said linking channel (31) which is disposed in the plane of said disk (para 30); and wherein said linking channel (31) is divided by microstructure units, the unnumbered raised portions between part channels 32, into two or more part channels (32, 33, 34) before opening into the mixing zone (7), and that the width of the part channels (32, 33, 34) is less than a width of the mixing zone (7) (figure 3a; para 51). The microstructure units, such as the one identified in the figure above, physically divide a linking channel into two or more part channels, such as two part channels 32 identified in the figures above, and the further child channels 33, 34 downstream of channels 32. Ehrfeld et al does not explicitly teach that the widths of the part channels be in the millimeter to submillimeter range: however, it would have been obvious to one of ordinary skill in the art to manufacture the disk of Ehrfeld et al so that all its channels be of millimeter to submillimeter range: the motivation would have

been the teaching by Ehrfeld et al that they disclose a "Micromixer", as their invention is titled. Alternatively, it has been held that where the only difference between a claimed invention and the prior art was a recitation of relative dimensions of the claimed device, and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

12. With regard to claim 21, Ehrfeld et al further teach that the static micromixer comprises a system for conveying the constituents that are kept separated until preparation of the formulation (paras 1, 15, claim 15) and the static micromixer comprises a housing (para 26). Ehrfeld et al do not explicitly teach that the housing should have at least 2 feed stream inlets for introduction of respective feeds to be mixed and at least one fluid outlet to be a product stream outlet for a product stream. However, it would have been obvious to one of ordinary skill in the art to provide two fluid inlets: the motivation would have been to supply the at least two fluids to be mixed from the at least two reservoirs taught by Ehrfeld et al (para 15); and at least one outlet: the motivation would have been because Ehrfeld et al teach their apparatus to be a micromixer (para 1), not a container for fluids.

13. The additional elements of claim 22, including that the static micromixer comprises a plurality of said disks (2a, 2b) arranged in a stack in which said disks are superposed over each other so that subsidiary channels communicating with the feed stream inlets are formed by said at least one inlet opening (4b) of each of said disks and

the mixing zones (7) of said disks together form a main channel connected with the at least one product stream outlet for carrying away a mixed product, and wherein the main channel and the subsidiary channels extend through said stack of said disks, are taught by Ehrfeld et al (paras 51-53, claim 15).

14. With regard to claim 23, Ehrfeld teaches that a ratio of the width of the mixing zone (7) to the width of each of the part channels (32, 33, 34) is greater than 2 (figure 3a).

15. The additional elements of claim 24, including that the at least one disk (2a, 2b) additionally has at least one flow-through opening, one of (4a, 4b), are taught by Ehrfeld et al (figure 3a).

16. The additional elements of claim 25, including that at least one of the inlet openings (4b) or flow-through openings (4a, 4b) or the mixing zone (7) is enclosed by the plane of the disk and that the linking channel (31) is formed by an indentation, are taught by Ehrfeld et al (paras 30, 51).

17. The additional elements of claim 26, including that at least one of the inlet openings (4b) or flow-through openings (4a, 4b) is disposed at the edge of the disk or as a recess at the edge of the disk, are taught by Ehrfeld et al (figure 3a).

18. The additional elements of claim 27, including that said at least one inlet opening (4b) of said disk (2a, 2b) comprises respective inlet openings (4b) for corresponding fluid streams, and said respective inlet openings are connected by corresponding linking channels (31) with said mixing zone (7), are taught by Ehrfeld et al (figure 3a).

19. The additional elements of claim 28, including that said at least one outlet opening (34) comprises respective outlet openings (34) arranged on a circular line, are taught by Ehrfeld et al (figure 3a).

20. The additional elements of claim 29, including that said disk (2a, 2b) is provided with additional through-going openings (4b) and with additional part channels (32-33-34) the latter being integrated into the microstructure units (identified regarding claim 1 above) and being separated from the part channels (32-33-34), are taught by Ehrfeld et al: there are in all four separate sets of inlet channel (4b)-part channel (32-33-34)-outlet (34) channel systems on the disk of Ehrfeld et al (figure 3a).

21. The additional elements of claim 30, including that the linking channels (31) of the disks (2a, 2b) in said stack are formed by indentations in the disks and the linking channels (31) are divided by said microstructure units disposed in the disks (2a, 2b) into said part channels (32-33-34) prior to opening into the mixing zone (7), are taught by Ehrfeld et al (figure 3a; paras 30, 51).

22. With regard to claim 49, Ehrfeld et al teach a static micromixer (Ehrfeld et al claim 15) for mixing two or more constituents (para 15)to form a mixture immediately prior to use of the mixture, said static micromixer comprising at least one component in the form of a disk (2a, 2b), and wherein said disk (2a, 2b) is provided with at least one inlet opening (4b) disposed in a plane of said disk for introduction of at least one feed stream into a linking channel (31) and with at least one outlet opening (34) disposed in the plane of said disk for outflow of the at least one feed stream into a mixing zone (7), said at least one inlet opening (4b) is connected with said at least one outlet opening

(34) in a communicating manner via said linking channel (31) which is disposed in the plane of said disk; and wherein said linking channel (31) is divided by microstructure units, the unnumbered raised portions between part channels 32, into two or more part channels (32, 33, 34) before opening into the mixing zone (7). Ehrfeld et al does not explicitly teach that the widths of the part channels be in the millimeter to submillimeter range: however, it would have been obvious to one of ordinary skill in the art to manufacture the disk of Ehrfeld et al so that all its channels be of millimeter to submillimeter range: the motivation would have been the teaching by Ehrfeld et al that they disclose a "Micromixer", as their invention is titled. Alternatively, it has been held that where the only difference between a claimed invention and the prior art was a recitation of relative dimensions of the claimed device, and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

23. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ehrfeld et al in view of US 6,207,719 B1 to Pardikes. Ehrfeld et al do not teach that the mixing zone (7) may filled by a molded element that closes off said at least one outlet opening (34) in an idle state, and said molded element is entirely or partly removed from the mixing zone (7) during operation, thereby entirely or partly opening the at least one outlet opening (34). However, it would have been obvious to one of ordinary skill in the art to supply a plug for the central channel formed by the mixing zone, as does for

instance Pardikes, who teaches a mixing chamber having bores to the outside 306, 310 (figure 14); which bores may be selectively closed with plugs (11:10-17). It would have been obvious to one of ordinary skill in the art to provide a plug closing off at least one end of the mixing zone, such that the outlet openings (34) leading to it are closed off: the motivation would have been to selectively open and close the channels leading to the mixing chamber of the apparatus, depending on specific needs (Pardikes 11:10-17).

***Conclusion***

24. **This action is made final.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Janca whose telephone number is (571) 270-5550. The examiner can normally be reached on M-Th 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on (571) 272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJJ

/DAVID L. SORKIN/
Primary Examiner, Art Unit 1797